

GEORGE ENGELMANN BOTANICAL NOTEBOOKS

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1871 Complete

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SYN. FL. N. AMER.

low, fading with age, open
and bracteated calyx-tube,
is *laevicaulis*. From New
Mexico and Colorado to California and Washington Territory. On dry foot-
hills from the Washoe Mountains to Salt Lake; 4,500–6,000 feet altitude;
June–September. (432.)

Ea 210

1871

115

*Cactaceæ of Clarence King's
Exploration of the Fortieth Parallel, pp. 115–120.*
1871. BY DR. GEORGE ENGELMANN. MISSOURI
BOTANICAL GARDEN.

MAMILLARIA (EUMAMILLARIA) GRAHAM, Eng. Globose or oval, usually simple, 1–3' high; on the short oval close-set tubercles are numerous thin but rigid whitish spines, 3–6" long, the outer 15–30 in a single series and straight, surrounding a stouter and longer hooked brown one; flowers small, nearly 1' wide, reddish; berry oval, green, with black pitted seeds.—Rocky localities in Southern New Mexico, Arizona and the adjoining parts of Utah.

MAMILLARIA PHELLOSPERMA, Eng. Resembling the last, rather larger, more oblong or cylindrical; tubercles longer and less crowded; spines more numerous, the outer 40–60 in two series, the exterior bristle-like, the inner more robust, with 3–4 brown central spines, of which one or more are hooked; flowers similar; berry club-shaped, scarlet; seed globose, with a larger spongy brown appendage.—Gravelly soil in Southern Utah and Arizona, rarer than the last.

MAMILLARIA (CORYPHANTHA) VIVIPARA, Haw., Var. Simple, oval, the almost terete tubercles bearing fascicles of 5–8 reddish-brown spines surrounded by 15–20 grayish ones in a single series, all straight and very rigid, the latter 5–8", the former even 10" long; flowers purple, often 2' or more in diameter, with numerous lance-subulate petals and fringed sepals; berry oval, green; seed pitted, light-brown.—Near St. George, Southern Utah, (J. E. Johnson.) Larger than the often caspitose forms of the eastern slopes and

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¹ MAMILLARIA, HAW. Sepals and petals united beyond the naked ovary into a short tube. Berry juicy, oval or club-shaped. Seeds brown or black; embryo straight, without albumen; cotyledons very short, globose.—Low globose or oval plants, simple or branched, covered with spine-bearing tubercles; flowers rising from the axils of the tubercles, usually small, about as wide as long, opening in sunshine only. Comprising two sections:—

§ EUMAMILLARIA, ENG. Flowers from the axils of the older (never grooved) tubercles, usually small.

§ CORYPHANTHA, ENG. Tubercles grooved on the upper surface; flowers usually large, from the axils of the youngest often scarcely developed tubercles.



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plains. Another simple form, but scarcely half as large, occurs in Colorado ^{interrupted ribs} and longer; ^{the others bro-} and possibly in Eastern Utah.

MAMILLARIA NUTTALLII, Eng. Smaller, globose, simple or sometimes cæspitose, with fewer (10-20) weaker ash-colored spines; flowers yellow ^{wide, with a} 1-2' broad; berries scarlet, subglobose; seeds few, black, globose, pitted. ^{lead-waters of} Common on the eastern slopes of the mountains of Colorado and perhaps ^(Gabb;) the be found in Eastern Utah. ^{35;)} the no

ECHINOCACTUS¹ SIMPSONI, Eng. Simple, globose or depressed, with ^{small ones but} ovate tubercles like a *Mamillaria*, bearing about 20 outer ash-colored spines ^{ECHINOCACTUS PU-} and 5-10 stouter darker inner ones, all straight and rigid; flowers from ^{sinuate rib} the top of the ^{just developing} tubercles, small, 9-12" broad, yellowish-green ^{rest, often cur-} to purplish; scales on the ovary very few; berry small, dry, with few black ^{all usually den-} tuberculated seeds.—Butte and Kobe Valleys, Utah, (H. Engelmann;) ^{Engelmann in P-} quent on the eastern slopes of the Rocky Mountains, Colorado; flowering ^{ECHINOCACTUS JO-} April and May. [Found on the Havallah, Battle and Toyabe Mountains, ^{a few low round} above Thousand Spring Valley, Nevada, only on high rocky ridges; 7-8,000 stoutish re- feet altitude; July, in flower. Heads 2-5' in diameter, often clustered, ^{tallest; the ce-} fleshy interior frequently colored. s. w.] A small variety, resembling ^{and wide, p-} of *M. vivipara* in habit, but the tubercles grooveless and fruiting at top, ^{1 tube, and ova-} spines 4-6" long, the inner scarcely different; a larger form has much larger ^{George in S-} tubercles and spines, often 12-14" long, the inner ones bright reddish ^{of the natura-} brown. (433.)

ECHINOCACTUS WHIPPLEI, Eng. & Big. Middle-sized, globose or oval, ^{one of the spec-} with 13 interrupted ribs; outer spines 7-11, mostly ivory-white, the lower ^{ECHINOCACTUS PO-} darkish, the upper much longer, flat and often curved; central spines 4, ^{ten over a fo-} upper broader, longer, white, the others brown, the lowest hooked; flowers ^{early flowers, t-} greenish-red, with few (2-5) sepals on the ovary, 9-15" long; not quite ^{ton.—From th-} wide; seeds few, large, tuberculate.—Heads 3-5' high; spines 3-20" long. ^{REUS & ENGELMA-} On the lower Colorado, (Bigelow, Newberry;) in Desert Valley, west ^{with 11-13 ribs,} Sevier Lake, Utah, (H. Engelmann;) the latter with more radial spines ^{REUS, HAW. Sepal-} and often with more than one hooked.

ECHINOCACTUS POLYANCISTRUS, Eng. & Big. Medium-sized, oval, ^{berry juicy, globose}

¹ **ECHINOCACTUS**, LINK & OTTO. Sepals and petals united beyond the sepal-bearing ovary, ^{berry straig-} a short tube. Berry globose or oval, juicy or dry, covered with scales and sometimes with wool. ^{ed, usually branched,} brown or black; embryo usually curved over a small albumen; cotyledons short, foliaceous, parallel ^{spines of previous} the sides of the seed.—Globose or oval, mostly simple, generally many-ribbed with bunches of spines ^{above species belong} the ribs, rarely tuberculated; flowers near the top, just above and close to the spines of the same side ^{as short, mostly as w-} usually large, as wide as long, open only in sunshine. ^{spined; cotyledons}



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—17 interrupted ribs; outer spines 20 or more, white, the uppermost broader and longer; central spines 5–10, upper one broadest, longest, white, curved, the others brown, terete, mostly hooked; flowers yellow, large, $2-2\frac{1}{2}'$ long and wide, with about 8 fringed sepals on the ovary; seeds as in the t.—Head-waters of the Mohave (Bigelow) to the sage-plains of Western Nevada, (Gabb;) the southern form 4–10' high, with longer spines, (the longest 3–5';) the northern but 3–4' high, with spines rarely more than the radial ones but $\frac{1}{4}$ –1' long.

ECHINOCACTUS PUBISPINUS, Eng. Small, (only 2' high,) oval, with 13 impressed sinuate ribs; outer spines 6–10, bristle-like, 1–4" long, the uppermost longest, often curved or hooked, with or without a stouter hooked central one, all usually densely pubescent.—Flower and fruit unknown. Found H. Engelmann in Pleasant Valley near Salt Lake Desert.

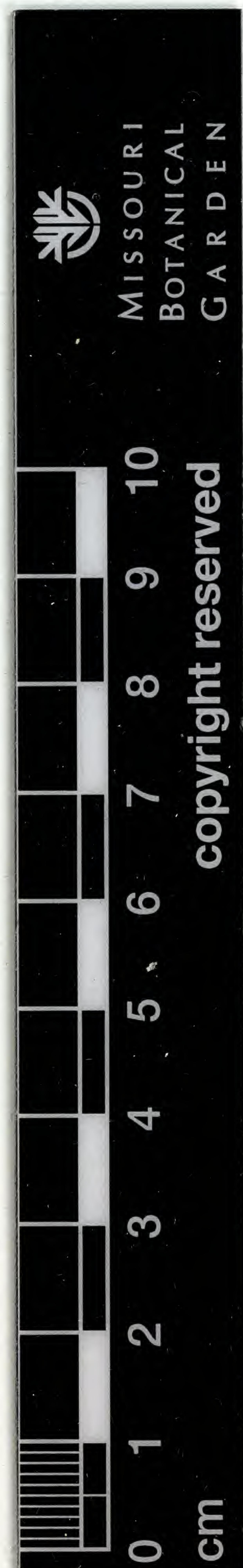
ECHINOCACTUS JOHNSONI, Parry MSS. Medium-sized, (4–6' high,) oval, 17–21 low rounded interrupted close-set often oblique ribs, densely covered with stoutish reddish-gray spines; the outer 10–14, $\frac{1}{2}$ – $1\frac{1}{4}'$ long, the upper longest; the central 4, stouter, recurved, $1\frac{1}{2}'$ long; flowers large, $2\frac{1}{4}'$ long and wide, purple or pink, with numerous reniform sepals on the ovary and tube, and ovate obtuse petals; seeds reticulate-pitted.—Discovered St. George in Southern Utah by J. E. Johnson, whose zeal for the development of the natural history and resources of his region is commemorated in the name of the species.

ECHINOCACTUS POLYCEPHALUS, Eng. and Big. Usually with several heads, often over a foot high, with few very stout annulated curved spines; very early flowers, the base of which, as well as the fruit, is enveloped in fine cotton.—From the Mohave region, and may be looked for in Southern Nevada.

CEREUS ENGELMANNI, Parry. Heads several, 4–12' high, cylindric or ovoid, with 11–13 ribs, bearing bunches of about 13 pale acicular radiating

¹*CEREUS*, Haw. Sepals and petals united above the sepal-bearing ovary into a short or usually long tube. Berry juicy, globose or oval, beset with scales (sometimes rather indistinct) or spines. Seeds brown or black; embryo straight or usually curved, without albumen; cotyledons short or foliaceous, mostly contrary to the sides of the seed.—Globose or oval, or mostly cylindric or columnar, few- or many-ribbed, usually branched, bearing bunches of spines on the ribs; flowers lateral, just above and opposite to the spines of previous seasons, usually large, fully open in sunlight or at night or rarely, permanently.

The above species belong to § *ECHINOCEREUS*, Eng.:—Heads commonly many, low, oval or cylindric; flowers short, mostly as wide as long; ovary covered with bunches of spines; stigmas green; seeds small, tuberculated; cotyledons short, straight.



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spines, 3-6" long, and about 4 darker (yellow, brown or black) stout and an^{OPUNTIA HYST} gular, straight or curved, central ones, 1-3' long; flowers very numerous^{ably only a form} large, (2½' broad or more,) purple, diurnal.—From Salt Lake Desert (H^{longer yellow} Engelmann) to Silver Peak in the Sierras, (Gabb,) and southward to South^{en Walker an}ern Utah (Johnson) and the Mohave country (Bigelow.)

CEREUS VIRIDIFLORUS, Eng. With very short pectinate pale and reddish^{Nevada; 5-6,0} brown spines and small green flowers.—Common in Colorado, and may be^{either purp} found in Utah.

OPUNTIA (PLATOPUNTIA) *BASILARIS*, Eng. & Big. Low; joints 5-8^{covered with} long, obovate or triangular, proliferous from their base, pubescent, unarmed^{the larger on} but beset with numerous dense fascicles of short brownish bristles, as is also^{berry spiny} the ovary; flowers large, 2½' in diameter, purple; fruit dry, with large and^{Johnson; a re} thick seeds.—Nevada, in the Silver Peak region south of Walker's Lake^{reen River in} (Gabb,) and southward.

OPUNTIA SPHÆROCARPA, Eng. & Big., Var. (?) *UTAHENSIS*, Eng. Prostrate; joints thick^{ing; joints thic} spines in the axils of the minute subulate leaves, few and mostly weak or soli^{long, very rig} tary or none, with few and very short bristles; flowers 3' in diameter, pale^{1½ long, with} yellow; fruit oval, almost spineless, at last dry.—In the pass west of Steptoe^{Near Mohave} Valley, Utah, (H. Engelmann.)

OPUNTIA MISSOURIENSIS, DC. Prostrate; joints medium-sized, obovate^{Engelmann,} or almost orbicular, tuberculate; leaves minute, subulate, all bearing in thei^{OPUNTIA FRAGI} axils 5-10 radiating or deflexed spines, 1-2' long, often with a few erec^{erete, 1-1½' lo} darker ones; flower large, 3' broad, yellow; ovary and dry fruit spiny.—Quite^{with 4-6 sm} variable, especially in the stoutness and color of the spines. From the Upper^{yellow; fru} Missouri to the Canadian and New Mexico, and throughout the Salt Lak^{with a few sh} Basin. [Found in Salt Lake Valley and the Wahsatch; 4,200-6,500 feet^{yellowstone, so} altitude; July, in flower. Joints sometimes 6' long and 4' broad. w.] (434. of the Wahsata

Var. [With smaller creeping joints, the numerous fascicles of short stout but doubtles^{spines strongly reflexed. Above Wahsatch Station in the Wahsatch Mount} OPUNTIA (CYLI^{ains; 7,000 feet altitude. w.] (435.)} joints small,

¹ *OPUNTIA*, Tourn. Sepals and petals united beyond the sepal-bearing ovary into a very shor^{es of straight} cup. Berry pulpy or dry. Seeds large, whitish, bony, flat, mostly irregular. Embryo curved around th^{more of the} albumen; cotyledons foliaceous, usually contrary to the sides of the seed.—Jointed, the joints broad an^{Walker's R} flat, or clavate or cylindrical, bearing bunches of barbed spines and bristles in the axils of small terete^{er; ovary an} deciduous leaves, and from their middle rather large flowers, opening only in sunshine and much wider^{Walker's R} than long. The above species belong to the two sections:—

§ *PLATOPUNTIA*, Eng. Joints flattened; embryo somewhat spiral.

§ *CYLINDROPUNTIA*, Eng. Joints clavate or cylindrical; embryo nearly circular.



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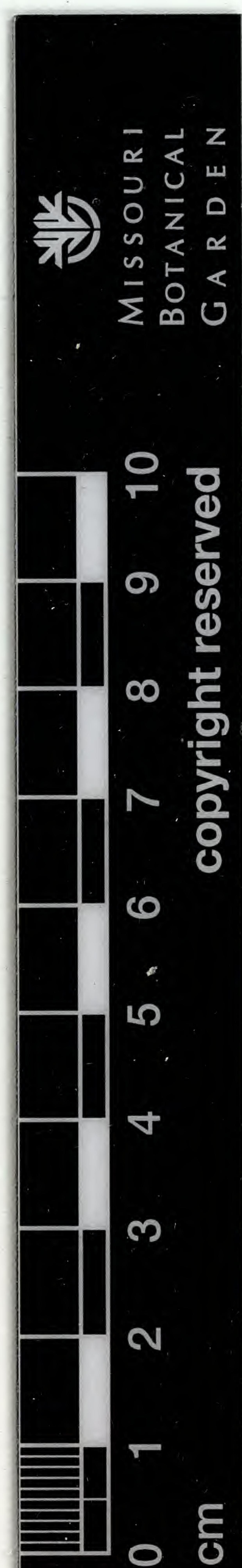
OPUNTIA HYSTRICINA, Eng. & Big. Very similar to the preceding and probably only a form of it, with longer and more numerous gray or reddish spines, longer yellow bristles, and usually smaller flowers.—New Mexico; between Walker and Carson Rivers, (H. Engelmann,) and Owen's Valley, Gabb,) Nevada. [Found abundantly in Monitor and Thousand Spring Valleys, Nevada; 5–6,000 feet altitude; July, in flower; September, in fruit. Flowers either purple or sulphur-yellow, scarcely smaller. w.] (436.)

OPUNTIA RUTILA, Nutt. Similar to *O. Missouriensis*; joints often larger, 3' by 4', covered with closely set bunches of mostly radiating and deflexed spines, the larger ones flattened and often twisted; flowers rose-red; ovary and dry berry spiny.—From Fillmore to St. George, Utah, (Dr. Palmer; J. E. Johnson;) a rediscovery of Nuttall's long-lost plant, who found it near the Green River in Southern Wyoming.

OPUNTIA ERINACEA, Eng. & Big. *Pac. R. R. Surv.* 4. 47, t. 13. Diffuse, ascending; joints thick, ovate, 2–2½' long, or sometimes elongated and almost cylindric, densely covered with clusters of 3–5 radiating spines, slender, ½–1½' long, very rigid, reddish-gray, with 2–4 smaller ones below; berry ovate, 1¼' long, with crowded clusters of 12–20 mostly deflexed spines, 3–6" long.—Near Mohave Creek, Southern California, (Bigelow.) [A specimen in Herb. Gray., collected by Dr. Bloomer near Virginia City, Nevada, (not seen by Dr. Engelmann,) may belong to this species. w.]

OPUNTIA FRAGILIS, Nutt. Joints small, ovate, compressed or tumid or even terete, 1–1½' long, fragile; larger spines 4, cruciate, mostly yellowish brown, with 4–6 smaller white radiating ones below; bristles few; flowers smaller, yellow; fruit smaller, with 20–28 clusters of bristles, only the upper ones with a few short spines; seeds few, regular.—On the Upper Missouri and Yellowstone, southward probably to New Mexico. [Found at the west base of the Wahsatch in Jordan Valley. Specimens not seen by Dr. Engelmann, but doubtless of this species. w.] (437.)

OPUNTIA (CYLINDROPUNTIA) PULCHELLA, Eng. Low, 3–10' high, spreading; joints small, slender, 1–3' long, 6" thick, clavate, tuberculated, with bunches of straight radiating spines 6–18" long, from white to nearly black, one or more of the inner longer ones flattened; flowers purple, 1½' or less in diameter; ovary and dry berry bearing numerous flexible not barbed bristles.—Near Walker's River, Nevada, (H. Engelmann, Gabb.) [Frequent in the valleys of Western Nevada from the Trinity Mountains to Monitor Valley;



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4-5,000 feet altitude; May-August. A very showy species, with sometimes 50 flowers upon a single plant; main stem erect, becoming 9" in thickness and occasionally showing 25 annual rings. w.] (438.)

OPUNTIA ARBORESCENS, Eng. 3-5° high or more, with horizontal branches, cylindric strongly tuberculated joints, numerous sheathed spines, large purple flowers, and tuberculated unarmed fruit.—New Mexico and Arizona, and probably farther northward.

OPUNTIA ACANTHOCARPA, Eng. & Big. Similar to the last; rather more slender and with more erect branches, smaller copper-colored flowers and rather even spiny, fruit.—Arizona, and probably Southern Utah.

OPUNTIA FRUTESCENS, Eng. 2-4° high, with slender terete joints 3" in thickness, very small yellow flowers and scarlet berries.—From Texas to Southeastern California, and probably farther northward. *

FICOIDÆ.

SESUVIUM PORTULACASTRUM, L., Var. Leaves spatulate and obtuse, as in *S. pentandrum*. Florida to New Jersey, in alkaline soil, Tru-ee Meadows and at the Hot Springs near Station, Nevada; 4,500 feet altitude; May-July. (439.)

UMBELLIFERA. MISSOURI BOTANICAL GARDEN GEORGE ENGELMANN PAPERS

OROGENIA¹ LINEARIFOLIA. Stem leafless, rising but an inch or two above the ground and very slender; leaves 2-3, upon filiform petioles, equaling the stem; leaflets 1-2' long and 1" wide, petiolulate, obtuse; umbels with 2-3 rays, 1-4" long; umbelllets 3-5-flowered; flowers nearly sessile; involucre none; involucels of a few (1-3) linear leaflets exceeding the rays; fruit 1½-2" long, oblong, subcompressed; tubers small, rounded, 3-5" in diameter.—Damp shaded ridge of the Wahsatch, north of Parley's Park; 7,500 feet altitude; June 28, in fruit. Near to *Erigenia*, both in habit and characters. PLATE XIV. Fig. 1. Plant; natural size. Fig. 2. Carpel; enlarged four diameters. Fig. 3. Cross-section of same; enlarged eight diameters. (440.)

¹ OROGENIA. Calyx-teeth minute. Stylopodia somewhat elevated. Fruit ovoid, but slightly compressed laterally and with a commissure but little narrowed; carpels dorsally compressed, slightly incurved; the 3 dorsal ribs filiform, the lateral thickened, cory and involute; vittæ obscure, 3 in each interval, and 2-4 in the commissure. Carpophore (?) adnate to the carpels and forming a thick cory mid-rib dividing the hollowed face of the commissure longitudinally. Seed somewhat concave.—Dwarf, scarcely caulescent, glabrous. Root tuberous. Leaves radical, 1-2-ternate; segments entire, linear. Umbel subcompound, with few very short unequal rays.



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long and 6" in diameter; petals a light sulphur-yellow, fading with age, open during the day. *M. ornata*, with "white" flowers and bracteated calyx-tube, was not met with. Stansbury's plant, so named, is *lævicaulis*. From New Mexico and Colorado to California and Washington Territory. On dry foot-hills from the Washoe Mountains to Salt Lake; 4,500-6,000 feet altitude; June-September. (432.)

CACTACEÆ.

BY DR. GEORGE ENGELMANN.

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MAMILLARIA¹ (EUMAMILLARIA) GRAHAM, Eng. Globose or oval, usually simple, 1-3' high; on the short oval close-set tubercles are numerous thin but rigid whitish spines, 3-6" long, the outer 15-30 in a single series and straight, surrounding a stouter and longer hooked brown one; flowers small, nearly 1' wide, reddish; berry oval, green, with black pitted seeds.—Rocky localities in Southern New Mexico, Arizona and the adjoining parts of Utah.

MAMILLARIA PHELLOSPERMA, Eng. Resembling the last, rather larger, more oblong or cylindrical; tubercles longer and less crowded; spines more numerous, the outer 40-60 in two series, the exterior bristle-like, the inner more robust, with 3-4 brown central spines, of which one or more are hooked; flowers similar; berry club-shaped, scarlet; seed globose, with a larger spongy brown appendage.—Gravelly soil in Southern Utah and Arizona, rarer than the last.

MAMILLARIA (CORYPHANTHA) VIVIPARA, Haw., Var. Simple, oval, the almost terete tubercles bearing fascicles of 5-8 reddish-brown spines surrounded by 15-20 grayish ones in a single series, all straight and very rigid, the latter 5-8", the former even 10" long; flowers purple, often 2' or more in diameter, with numerous lance-subulate petals and fringed sepals; berry oval, green; seed pitted, light-brown.—Near St. George, Southern Utah, (J. E. Johnson.) Larger than the often caespitose forms of the eastern slopes and

¹ **MAMILLARIA**, Haw. Sepals and petals united beyond the naked ovary into a short tube. Berry juicy, oval or club-shaped. Seeds brown or black; embryo straight, without albumen; cotyledons very short, globose.—Low globose or oval plants, simple or branched, covered with spine-bearing tubercles; flowers rising from the axils of the tubercles, usually small, about as wide as long, opening in sunshine only. Comprising two sections:—

§ **EUMAMILLARIA**, Eng. Flowers from the axils of the older (never grooved) tubercles, usually small.

§ **CORYPHANTHA**, Eng. Tubercles grooved on the upper surface; flowers usually large, from the axils of the youngest often scarcely developed tubercles.

(Natson: Flora of Utah & Nevada).

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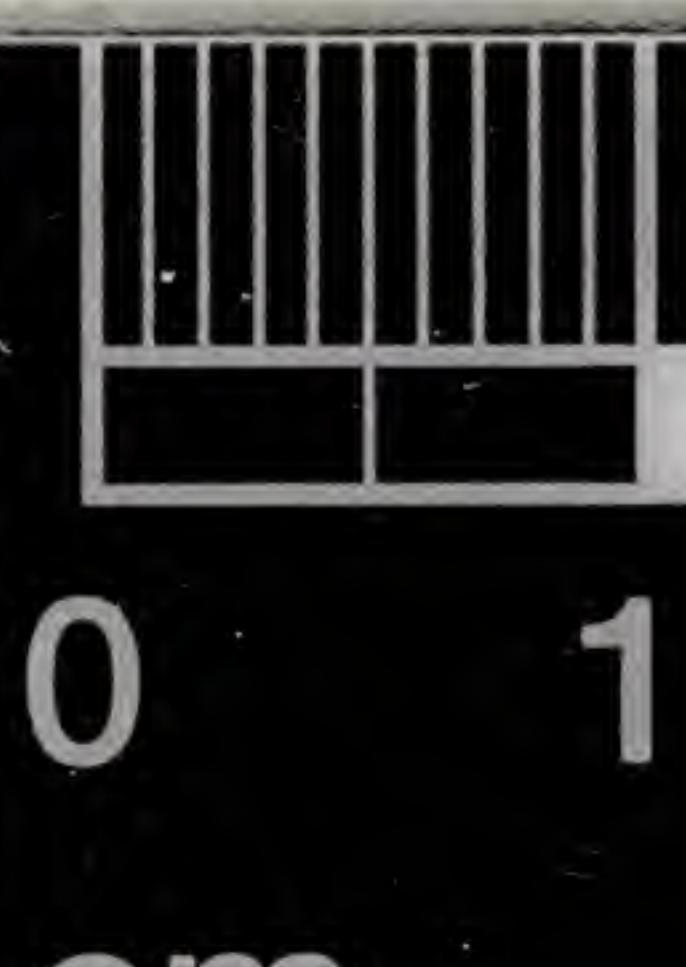
MAMILLARIA NUTTALLII, Eng. Smaller, globose, simple or sometimes cæspitose, with fewer (10-20) weaker ash-colored spines; flowers yellow, 1-2' broad; berries scarlet, subglobose; seeds few, black, globose, pitted.—Common on the eastern slopes of the mountains of Colorado and perhaps to be found in Eastern Utah.

ECHINOCACTUS¹ SIMPSONI, Eng. Simple, globose or depressed, with ovate tubercles like a *Mamillaria*, bearing about 20 outer ash-colored spines and 5-10 stouter darker inner ones, all straight and rigid; flowers from the top of the just developing tubercles, small, 9-12" broad, yellowish-green to purplish; scales on the ovary very few; berry small, dry, with few black tuberculated seeds.—Butte and Kobe Valleys, Utah, (H. Engelmann;) frequent on the eastern slopes of the Rocky Mountains, Colorado; flowering in April and May. [Found on the Havallah, Battle and Toyabe Mountains, and above Thousand Spring Valley, Nevada, only on high rocky ridges; 7-8,000 feet altitude; July, in flower. Heads 2-5' in diameter, often clustered, the fleshy interior frequently colored. s. w.] A small variety, resembling forms of *M. vivipara* in habit, but the tubercles grooveless and fruiting at top, has spines 4-6" long, the inner scarcely different; a larger form has much larger tubercles and spines, often 12-14" long, the inner ones bright reddish-brown. (433.)

ECHINOCACTUS WHIPPLEI, Eng. & Big. Middle-sized, globose or oval, with 13 interrupted ribs; outer spines 7-11, mostly ivory-white, the lowest darkish, the upper much longer, flat and often curved; central spines 4, the upper broader, longer, white, the others brown, the lowest hooked; flowers greenish-red, with few (2-5) sepals on the ovary, 9-15" long, not quite so wide; seeds few, large, tuberculate.—Heads 3-5' high; spines 3-20" long. On the lower Colorado, (Bigelow, Newberry;) in Desert Valley, west of Sevier Lake, Utah, (H. Engelmann;) the latter with more radial spines and often with more than one hooked.

ECHINOCACTUS POLYANCISTRUS, Eng. & Big. Medium-sized, oval, with

¹ *ECHINOCACTUS*, LINK & OTTO. Sepals and petals united beyond the sepal-bearing ovary into a short tube. Berry globose or oval, juicy or dry, covered with scales and sometimes with wool. Seeds brown or black; embryo usually curved over a small albumen; cotyledons short, foliaceous, parallel to the sides of the seed.—Globose or oval, mostly simple, generally many-ribbed with bunches of spines on the ribs, rarely tuberculated; flowers near the top, just above and close to the spines of the same season, usually large, as wide as long, open only in sunshine.



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13-17 interrupted ribs; outer spines 20 or more, white, the uppermost broader and longer; central spines 5-10, upper one broadest, longest, white, curved, the others brown, terete, mostly hooked; flowers yellow, large, $2-2\frac{1}{2}'$ long and wide, with about 8 fringed sepals on the ovary; seeds as in the last.—Head-waters of the Mohave (Bigelow) to the sage-plains of Western Nevada, (Gabb;) the southern form 4-10' high, with longer spines, (the longest 3-5';) the northern but 3-4' high, with spines rarely more than 2', the radial ones but $\frac{1}{4}-1'$ long.

ECHINOCACTUS PUBISPINUS, Eng. Small, (only 2' high,) oval, with 13 compressed sinuate ribs; outer spines 6-10, bristle-like, 1-4" long, the uppermost longest, often curved or hooked, with or without a stouter hooked central one, all usually densely pubescent.—Flower and fruit unknown. Found by H. Engelm. in Pleasant Valley near Salt Lake Desert.

ECHINOCACTUS JOHNSONI, Parry MSS. Medium-sized, (4-6' high,) oval, with 17-21 low rounded interrupted close-set often oblique ribs, densely covered with stoutish reddish-gray spines; the outer 10-14, $\frac{1}{2}-1\frac{1}{4}'$ long, the upper longest; the central 4, stouter, recurved, $1\frac{1}{2}'$ long; flowers large, $2-2\frac{1}{4}'$ long and wide, purple or pink, with numerous reniform sepals on the ovary and tube, and ovate obtuse petals; seeds reticulate-pitted.—Discovered about St. George in Southern Utah by J. E. Johnson, whose zeal for the development of the natural history and resources of his region is commemorated in the name of the species.

ECHINOCACTUS POLYCEPHALUS, Eng. and Big. Usually with several heads, often over a foot high, with few very stout annulated curved spines and very early flowers, the base of which, as well as the fruit, is enveloped in dense cotton.—From the Mohave region, and may be looked for in Southern Nevada.

CEREUS¹ ENGELMANNI, Parry. Heads several, 4-12' high, cylindric or ovate, with 11-13 ribs, bearing bunches of about 13 pale acicular radiating

¹*CEREUS*, Haw. Sepals and petals united above the sepal-bearing ovary into a short or usually long tube. Berry juicy, globose or oval, beset with scales (sometimes rather indistinct) or spines. Seeds brown or black; embryo straight or usually curved, without albumen; cotyledons short or foliaceous, commonly contrary to the sides of the seed.—Globose or oval, or mostly cylindric or columnar, few- or many-ribbed, usually branched, bearing bunches of spines on the ribs; flowers lateral, just above and close to the spines of previous seasons, usually large, fully open in sunlight or at night or, rarely, permanently.

The above species belong to § *ECHINOCERUS*, Eng. :—Heads commonly many, low, oval or cylindric; flowers short, mostly as wide as long; ovary covered with bunches of spines; stigmas green; seeds small, tuberculated; cotyledons short, straight.

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spines, 3-6" long, and about 4 darker (yellow, brown or black) stout and angular, straight or curved, central ones, 1-3' long; flowers very numerous, large, (2½' broad or more,) purple, diurnal.—From Salt Lake Desert (H. Engelmann) to Silver Peak in the Sierras, (Gabb,) and southward to Southern Utah (Johnson) and the Mohave country (Bigelow.)

CEREUS VIRIDIFLORUS, Eng. With very short pectinate pale and reddish-brown spines and small green flowers.—Common in Colorado, and may be found in Utah.

*OPUNTIA*¹ (*PLATOPUNTIA*) *BASILARIS*, Eng. & Big. Low; joints 5-8' long, obovate or triangular, proliferous from their base, pubescent, unarmed, but beset with numerous dense fascicles of short brownish bristles, as is also the ovary; flowers large, 2½' in diameter, purple; fruit dry, with large and thick seeds.—Nevada, in the Silver Peak region south of Walker's Lake, (Gabb,) and southward.

OPUNTIA SPHÆROCARPA, Eng. & Big., Var. (?) *UTAHENSIS*, Eng. Prostrate; joints small, orbicular-ovate, 2-3' long and nearly as wide, thick; spines in the axils of the minute subulate leaves, few and mostly weak or solitary or none, with few and very short bristles; flowers 3' in diameter, pale-yellow; fruit oval, almost spineless, at last dry.—In the pass west of Steptoe Valley, Utah, (H. Engelmann.)

OPUNTIA MISSOURIENSIS, DC. Prostrate; joints medium-sized, obovate or almost orbicular, tuberculate; leaves minute, subulate, all bearing in their axils 5-10 radiating or deflexed spines, 1-2' long, often with a few erect darker ones; flower large, 3' broad, yellow; ovary and dry fruit spiny.—Quite variable, especially in the stoutness and color of the spines. From the Upper Missouri to the Canadian and New Mexico, and throughout the Salt Lake Basin. [Found in Salt Lake Valley and the Wahsatch; 4,200-6,500 feet altitude; July, in flower. Joints sometimes 6' long and 4' broad. w.] (434.)

Var. [With smaller creeping joints, the numerous fascicles of short stout spines strongly reflexed. Above Wahsatch Station in the Wahsatch Mountains; 7,000 feet altitude. w.] (435.)

¹ *OPUNTIA*, Tourn. Sepals and petals united beyond the sepal-bearing ovary into a very short cup. Berry pulpy or dry. Seeds large, whitish, bony, flat, mostly irregular. Embryo curved around the albumen; cotyledons foliaceous, usually contrary to the sides of the seed.—Jointed, the joints broad and flat, or clavate or cylindrical, bearing bunches of barbed spines and bristles in the axils of small terete deciduous leaves, and from their middle rather large flowers, opening only in sunshine and much wider than long. The above species belong to the two sections:—

§ *PLATOPUNTIA*, Eng. Joints flattened; embryo somewhat spiral.

§ *CYLINDROPUNTIA*, Eng. Joints clavate or cylindrical; embryo nearly circular.

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OPUNTIA HYSTRICINA, Eng. & Big. Very similar to the preceding and probably only a form of it, with longer and more numerous gray or reddish spines, longer yellow bristles, and usually smaller flowers.—New Mexico; between Walker and Carson Rivers, (H. Engelmann,) and Owen's Valley, (Gabb,) Nevada. [Found abundantly in Monitor and Thousand Spring Valleys, Nevada; 5-6,000 feet altitude; July, in flower; September, in fruit. Flowers either purple or sulphur-yellow, scarcely smaller. w.] (436.)

OPUNTIA RUTILA, Nutt. Similar to *O. Missouriensis*; joints often larger, 3' by 4', covered with closely set bunches of mostly radiating and deflexed spines, the larger ones flattened and often twisted; flowers rose-red; ovary and dry berry spiny.—From Fillmore to St. George, Utah, (Dr. Palmer; J. E. Johnson;) a rediscovery of Nuttall's long-lost plant, who found it near the Green River in Southern Wyoming.

OPUNTIA ERINACEA, Eng. & Big. *Pac. R. R. Surv.* 4. 47, t. 13. Diffuse, ascending; joints thick, ovate, 2-2½' long, or sometimes elongated and almost cylindric, densely covered with clusters of 3-5 radiating spines, slender, ½-1½' long, very rigid, reddish-gray, with 2-4 smaller ones below; berry ovate, 1¼' long, with crowded clusters of 12-20 mostly deflexed spines, 3-6" long.—Near Mohave Creek, Southern California, (Bigelow.) [A specimen in Herb. Gray., collected by Dr. Bloomer near Virginia City, Nevada, (not seen by Dr. Engelmann,) may belong to this species. w.]

OPUNTIA FRAGILIS, Nutt. Joints small, ovate, compressed or tumid or even terete, 1-1½' long, fragile; larger spines 4, cruciate, mostly yellowish brown, with 4-6 smaller white radiating ones below; bristles few; flowers smaller, yellow; fruit smaller, with 20-28 clusters of bristles, only the upper ones with a few short spines; seeds few, regular.—On the Upper Missouri and Yellowstone, southward probably to New Mexico. [Found at the west base of the Wahsatch in Jordan Valley. Specimens not seen by Dr. Engelmann, but doubtless of this species. w.] (437.)

OPUNTIA (CYLINDROPUNTIA) PULCHELLA, Eng. Low, 3-10' high, spreading; joints small, slender, 1-3' long, 6" thick, clavate, tuberculated, with bunches of straight radiating spines 6-18" long, from white to nearly black, one or more of the inner longer ones flattened; flowers purple, 1½' or less in diameter; ovary and dry berry bearing numerous flexible not barbed bristles.—Near Walker's River, Nevada, (H. Engelmann, Gabb.) [Frequent in the valleys of Western Nevada from the Trinity Mountains to Monitor Valley;



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4-5,000 feet altitude; May-August. A very showy species, with sometimes 50 flowers upon a single plant; main stem erect, becoming 9" in thickness and occasionally showing 25 annual rings. w.] (438.)

OPUNTIA ARBORESCENS, Eng. 3-5° high or more, with horizontal branches, cylindric strongly tuberculated joints, numerous sheathed spines, large purple flowers, and tuberculated unarmed fruit.—New Mexico and Arizona, and probably farther northward.

OPUNTIA ACANTHOCARPA, Eng. & Big. Similar to the last; rather more slender and with more erect branches, smaller copper-colored flowers and rather even spiny, fruit.—Arizona, and probably Southern Utah.

OPUNTIA FRUTESCENS, Eng. 2-4° high, with slender terete joints 3" in thickness, very small yellow flowers and scarlet berries.—From Texas to Southeastern California, and probably farther northward.

FICOIDEÆ.

SESUVIUM PORTULACASTRUM, L., Var. Leaves spatulate-obovate and obtuse, as in *S. pentandrum*. Florida to New Jersey. Growing in alkaline soil, Truckee Meadows and at the Hot Springs near Meigs's Station, Nevada; 4,500 feet altitude; May-July. (439.)

UMBELLIFERÆ.

OROGENIA¹ LINEARIFOLIA. Stem leafless, rising but an inch or two above the ground and very slender; leaves 2-3, upon filiform petioles, equaling the stem; leaflets 1-2' long and 1" wide, petiolulate, obtuse; umbels with 2-3 rays, 1-4' long; umbelllets 3-5-flowered; flowers nearly sessile; involucre none; involucels of a few (1-3) linear leaflets exceeding the rays; fruit 1½-2" long, oblong, subcompressed; tubers small, rounded, 3-5" in diameter.—Damp shaded ridge of the Wahsatch, north of Parley's Park; 7,500 feet altitude; June 28, in fruit. Near to *Erigenia*, both in habit and characters. PLATE XIV. Fig. 1. Plant; natural size. Fig. 2. Carpel; enlarged four diameters. Fig. 3. Cross-section of same; enlarged eight diameters. (440.)

¹ OROGENIA. Calyx-teeth minute. Stylopodia somewhat elevated. Fruit ovoid, but slightly compressed laterally and with a commissure but little narrowed; carpels dorsally compressed, slightly incurved; the 3 dorsal ribs filiform, the lateral thickened, cory and involute; vittæ obscure, 3 in each interval, and 2-4 in the commissure. Carpophore (?) adnate to the carpels and forming a thick cory midrib dividing the hollowed face of the commissure longitudinally. Seed somewhat concave.—Dwarf, scarcely caulescent, glabrous. Root tuberous. Leaves radical, 1-2-ternate; segments entire, linear. Umbel subcompound, with few very short unequal rays.

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than the subulate ovary; petals $\frac{1}{2}$ –1" long, obovate, entire, scarcely exceeding the longer stamens and style, deciduous with the stamens from the calyx; capsules sessile upon the petiole, somewhat 4-angled, nearly straight, attenuate-subulate above; seeds oblong-cylindrical, on a filiform placenta.—Stems 1–4' high, often becoming densely crowded with the obconical capsules, which are 4–6" long. Discovered by Nuttall in Southern Idaho. Not rare in Nevada from the Havallah Range to the East Humboldt Mountains, and found in Heber Valley in the Wahsatch; 6–8,000 feet altitude; June–August. (425.)

GAURA PARVIFLORA, Dougl. Stem tall, erect, and with the margin of the leaves villous with soft white hairs; leaves ovate-lanceolate, acute or acuminate, repand-denticulate, clothed on both sides with a short velvety pubescence; spike virgate, strict, many-flowered, elongating in fruit; bracts lanceolate-subulate; flowers very small, the calyx-tube shorter than the glabrous ovary and exceeding the segments; anthers oval, retuse, attached by the middle; stigmas not at all or scarcely produced beyond the indusium; fruit oblong, sessile, obtusely angled above, 4-nerved.—Stems 2–5° high, with small rose-colored flowers, and leaves 1–3' in length; capsules 3–4" long, obtuse at maturity. From Louisiana to Arizona and northward to the Platte and the Columbia; rather rare. Humboldt Pass, Nevada; Stansbury Island, Salt Lake; June, September. (426.)

CIRCAEA ALPINA, L., Var. *INTERMEDIA*, Ehrh. *DC. Prodr.* 3. 63. Stems erect, 3–10' high; leaves slightly repand-denticulate, cordate, acuminate; bracts almost none; fruit 1-celled.—It is nearest to *C. alpina*, but is the *C. Lutetiana*, Var. *occidentalis*, of Nuttall, in *Herb. Gray*. Also collected by Lyall in the Galton Mountains, and by Bolander in California. The species extends from the Northern States and Canada to the Saskatchewan, Oregon and Sitka. Found in the Wahsatch Mountains, Utah; 7–8,000 feet altitude; July, August. (427.)

LOASACEÆ.

MENTZELIA ALBICAULIS, Dougl. Stem 6–18' high, branching from the base, white and polished and nearly glabrous below, rather weak; leaves lanceolate, remote, more or less deeply sinuate-pinnatifid or toothed, sessile; flowers solitary or somewhat clustered, bracteolate; petals obovate, 2" long, light yellow, scarcely exceeding the short subulate-lanceolate calyx-segments;

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filaments 15–30, subulate-filiform or occasionally somewhat dilated; capsules cylindric, narrow, elongated; seeds 20–40.—From Sonora and New Mexico to California, Utah and Colorado. Frequent in Nevada from the Washoe to the East Humboldt Mountains, and also found on Carrington Island, Salt Lake; 4,200–8,000 feet altitude; May–July. (428.)

Var. *GRACILENTA*. (*M. gracilenta*, T. & G.) Flowers usually somewhat capitate, 2–3 times larger, petals 2–4" long, deep yellow with an orange base; stems simple or branched, erect and strict; leaves very variable, often linear-pinnatifid with numerous segments, or oblong- or ovate-lanceolate and more or less entire.—California and Southern Oregon, (Cronkhite.) It is 506 and 575 Brewer, 165 Coulter, and *M. Veatchiana*, Kell. Frequent from the Washoe to the West Humboldt Mountains, Nevada; 5,000 feet altitude; May–July. (429.)

Var. *INTEGRIFOLIA*. Usually branched; leaves ovate, oblong or oblong-lanceolate, entire or sinuately toothed or pinnatifid; flowers and fruit as in the ordinary *M. albicaulis*, but the seeds rather few (6–20) and some of the 15–20 filaments occasionally petaloid.—There seems very little to separate this from *M. micrantha*, H. & A., which has the same habit and foliage and is by no means constant in having a 3-seeded capsule, having sometimes half-a-dozen or more seeds. This is 663 Geyer, 571 Hall & Harbour, and 195 Vasey. East Humboldt Mountains, Nevada, and Antelope Island and the Wahsatch, Utah; 4,500–6,000 feet altitude; June, July. (430.)

MENTZELIA CONGESTA, Nutt. Stem 6–10' high, branching, pubescent, white; leaves short, the lower linear-lanceolate, entire or pinnatifid, the upper ones clasping; bracts membranous, toothed, broadly ovate and embracing the sessile clusters of (3–5) flowers; petals 2" in length, yellow, orange at base, a little longer than the calyx; stamens about 20; capsules clavate-oblong, 12–20-seeded.—Rare; collected only by Nuttall in Southern Idaho. Found on the foot-hills of the Toyabe Mountains, east of Austin, Nevada; 6,000 feet altitude; July. (431.)

MENTZELIA LÆVICAULIS, T. & G. Tall, 2–3° high, stout, branching; leaves lanceolate, sinuate-pinnatifid, sessile; flowers large and showy, terminating the branches and often somewhat crowded; bracteoles none, or few and subulate; petals 5 or rarely 10, 2' long, yellow, erect-spreading, lanceolate, acute, longer than the lanceolate acuminate sepals; stamens very many, the 5 outer filaments dilated; seeds numerous, winged.—Mature capsule 1'–1½'

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